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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/520,080

01/05/2005

Abdoulaye Doucoure

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EXAMINER

MENON, KRISHNAN S

ART UNIT

PAPER NUMBER

1723

MAIL DATE

DELIVERY MODE

05/02/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/520,080	<b>Applicant(s)</b> DOUCOURE ET AL.	
	<b>Examiner</b> Krishnan S. Menon	<b>Art Unit</b> 1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 January 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 19-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 and 31-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

Claims 1-33 are pending as preliminarily amended on 1/5/05.

### ***Election/Restrictions***

Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-18 and 31-33, drawn to microporous halopolymer membrane and its use.

Group II, claim(s) 19-30, drawn to process of making a microporous membrane.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The special technical feature of claims 1-18, CWST >40 dynes/cm, which is shown by the prior art Sipsas (US 5,198,505), an X or Y reference, to lack novelty or inventive step and thus does not define a contribution over the prior art.

During a telephone conversation with Jeremy Jay on 4/26/07 a provisional election was made with traverse to prosecute the invention of group I, claims 1-18 and 31-33. Affirmation of this election must be made by applicant in replying to this Office action. Claims 19-30 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 6,11 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by, or in the alternative, under 35 USC 103(a) as being obvious over, Sipsas et al (US 5,198,505).

Sipsas teaches a PVdF hydrophilic membrane (abstract, . Sipsas does not specify the CWST of the membrane, but it should be inherently above 40 dynes/cm because it is hydrophilic, which means water – wettable, and it should have a CWST approaching 72 dynes/cm; the surface tension of water, to be water-wettable.

Since the material is PVdF, it will not have any metal extractable matter.

The water bubble point of at least 75 psi is a characteristic of the pore size and pore size distribution of the hydrophilic PVdF membrane. The reference does not say anything about the bubble point. However, since the reference teaches a microporous

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membrane with pore size range 0.01 – 1  $\mu\text{m}$  (column 3, lines 10-27), it would be obvious to one of ordinary skill in the art at the time of invention to have the membrane with the specific bubble point which is hydrophilic as taught by Sipsas.

Sipsas also does not say if the wetting/dewetting ratio is at least about 0.7 for 2 or more cycles. However, the teaching of Sipsas appears to imply that the hydrophilic property developed in the membrane is permanent due to its change in crystallinity – see column 2, lines 41-51. Therefore the ratio should stay about 1 in repeated cycles.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-18 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sipsas; Sirkar, et al (US 5,053,132); Fujimoto, et al (US 5,130,024); Yokoe, et al (US 5,718,957); Kawai et al (US 5,158,680); Kuzowski et al (US 5,437,900); and/or Eng et al (US 3,935,096)

These claims recite a microporous halopolymer membrane with the following limitations in various combinations:

- first and second surface separated by a thickness
- CWST of at least 40,26,45,58 dynes/cm through the thickness of the membrane

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- Wetting/dewetting ratio of at least about 7 for 2 or more cycles
- At least one surface has F/C ratio of about 1.2 or more (Sipsas has 1.0 or more in PVdF – close enough!)
- Water bubble point of at least about 33 or 45 or 75 psi
- Nominal pore size in the range 0.02-0.1  $\mu\text{m}$
- Halopolymer is a fluoropolymer, or PTFE
- Halopolymer membrane resists dewetting when contacted with hot water
- At least one surface had O/C ratio 0.15 or less
- Less than 100 ppb extractables or 30 or 15 ppb metal extractables

Sipsas teaches a PVdF membrane which is heat-treated to make uniformly hydrophilic as shown in the rejection at paragraph 1 above. The reference does not teach the F/C ratio as “about 1.2 or more”. However, applicant lists PVdF as one of the materials that can be used in the invention, and thus inherently would have C/F ratio of “about 1.2”. Also, ‘about 1.2’ could mean a little less than 1.2 or a little more than 1.2. This range can be from 0 (no fluorine atoms) to a little more than 2 (situations with fully fluorinated polymer, and having CF<sub>3</sub> chain terminals would make the ratio slightly higher than 2.0). The reference teaches PVdF membrane, F/C ratio can be at least 1.0, and can be a little more than 1.0 because of over fluoridation during formation of the PVdF (For further evidence, see the reference Yokoe, US 5,718,957 which teaches that PVdF has an F/C ratio less than 1.6), and 1.0 is close enough to be a little less than 1.2, and thus makes this claim limitation obvious. Surface ratio of O/C is less than 0.15, it is in fact 0 in PVdF, since heat treatment only changes crystallinity as shown above.

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Sipsas does not teach PTFE, but it would be obvious to one of ordinary skill in the art at the time of invention that since PTFE is also a fluoropolymer, it would also become hydrophilic as PVdF by the heat treatment.

Hydrophilic fluoropolymers, and hydrophilic PTFE are also well known in the art as taught by Sipsas and other references listed. Sirkar teaches at column 4, lines 50-61, that PTFE can be made hydrophilic by treatment with sulfuric acid, chromic acid, strong oxidizing agents or by corona discharge. Fujimoto teaches treating PTFE with perfluoroalkyl sulfonated to make it hydrophilic, and perfluoroalkyl sulfonated would have F/C ratio as claimed. Kawai teaches making PTFE hydrophilic by immersing in alcohols, etc. Kuzowski teaches plasma-treating the PTFE membrane to make it hydrophilic. Eng teaches sulfonated perfluoroalkyl polymer membranes such as Nafion™, which are hydrophilic and have the F/C ratio and other properties claimed.

Claim 31 is product by process, which is unpatentable. Claims 32 and 33 are intended use of the membrane, which is also not patentable.

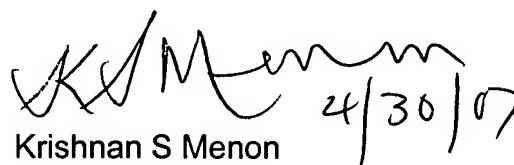
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Krishnan S Menon  
Primary Examiner  
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